



Original Research Article

Notes on the taxonomy of *Liparis petiolata* (D.Don) Hunt & Summerh. [Orchidaceae], a new Synonym, typification and Red List Assessment in Indian Perspective

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Abstract: Morpho-taxonomy of *Liparis petiolata* (D.Don) Hunt & Summerh. [Orchidaceae] has been studied based on protologue, type specimens, herbarium specimens, fresh collections and secondary literature. *Liparis tigerhillensis* A.P. Das & Chanda was compared with *L. petiolata* and found conspecific. Lectotype is designated for *Liparis tigerhillensis*. Red List assessment of *Liparis petiolata* was conducted by applying the IUCN Criteria and assessed as 'Vulnerable' in Indian perspective. A detailed description, coupled with information on its phenology, habitat, distribution and photographs is provided for easy recognition of the species. The taxonomic consequences on its synonymy and typification are discussed. The rationale for its red list assessment has also been provided.

Keywords: Orchidaceae, Taxonomy, morphology, synonymy, conservation, India.

INTRODUCTION

Liparis Rich. [ORCHIDACEAE-EPIDENDROIDEAE-MALAXIDEAE-MALAXIDINAE] represent one of the Orchid genera with rich species diversity. Pridgeon et al. (2005) have considered *Liparis* as polyphyletic which represent assemblage of taxa with diverse vegetative and floral morphology. The genus includes both terrestrial as well as epiphytic species. The plant size, nature of rhizome, pseudobulbs, number, position and nature of leaves, flower size, venation in petals and sepals, size, shape and ornamentation of labellum, nature of column and its wing are considered taxonomically important characters in species delimitation within this genus. Chase et al. (2015) reported 426 taxa under

the genus *Liparis* globally which are distributed in India, China, SE Asia, Pacific Islands to Australia and some species found in Europe and North America. In India, the genus is represented by 42 species and 1 variety which are distributed mainly in the Himalayan region with some species found in peninsular India and Andaman & Nicobar Islands.

While working on the taxonomic studies of the genus *Liparis* in North-East India, the authors came across a species *Liparis tigerhillensis* A.P. Das & Chanda which was described in 1989 and considered endemic to the Darjeeling Himalaya. The type specimens mentioned in the protologue were not traceable and this species was never collected by anyone after its

type collection. The description and illustration in its protologue were compared with *Liparis petiolata* (D. Don) Summerh. and found to have identical morphological features. Therefore, following the principle of priority as per Turland et al. (2025), *Liparis tigerhillensis* has been reduced here as a heterotypic synonym of *Liparis petiolata*. As the type specimens of *Liparis tigerhillensis* are not traceable in any of the designated herbaria, the illustration in its protologue (which is the only original material associated with this name) has been designated here as its lectotype. *Liparis petiolata* is distributed in India, Bhutan, China, Indo-China, Nepal and Thailand. In India, the species is recorded from Arunachal Pradesh, Meghalaya, Nagaland, Sikkim and West Bengal in the Eastern Himalaya and North-East India phytogeographic regions. Considering its distribution range in the country, declining population and habitat quality and with application of Criterion B of IUCN (IUCN, 2012a, b; 2024), this species has been assessed as 'Vulnerable' in Indian perspective. A detailed description, coupled with information on its phenology, habitat, distribution and photographs is provided for easy recognition of the species. The taxonomic consequences on its synonymy and typification are discussed. The rationale for its red list assessment has also been provided.

TAXONOMIC TREATMENT

Liparis petiolata (D. Don) P.F. Hunt & Summerh., Kew Bull. 20: 52. 1966; Seidenf., Dansk Bot. Arch. 31(1): 12, f.3. 1976; Karthik. et al., Fl. Ind. Enum. Monocot.: 149. 1989; Sath. Kumar & Manilal, Cat. Ind. Orch.: 78. 1994; Hynn. & al. in Hajra & U. Chatterjee, Orch. Nagaland: 209. 2000; N. Pearce & P.J. Cribb, Orch. Bhutan: 202. 2002; C.R. Deb et al., J. Orch. Soc. India 17(1-2): 10. 2003; Lucksom, Orch. Sikkim NE Himalaya: 281, f.174, pl.10. 2007; Misra, Orch. India: 305. 2007; C.S. Rao & S.K. Singh, Wild Orch. Meghalaya: 37. 2015; S.K. Singh et al., Orch. India Pic. Guide: 349. 2019; Agrawala et al., Wild Orch. West Bengal: 334. 2023. *Acianthus petiolatus* D. Don, Prodr. Fl. Nepal.: 29. 1825. TYPE: Nepal, Sheopore, Wallich 1945 (Lectotype: C, inadvertently designated by Seidenfaden, 1976).

Malaxis cordifolia Sm. in A. Rees, Cycl. 22: 12. 1812. TYPE: Nepal, Narainhetty, Buchanan-Hamilton s.n. (Holotype LINN, Herb. No. 1396.15).

Liparis nepalensis Lindl., Bot. Reg. 11: sub t.882. 1825; Hook.f., Fl. Brit. India 5: 693. 1890; King & Pantl., Ann. Roy. Bot. Gard. Calcutta 8: 26, t.32. 1898. TYPE: Nepal, Coll. Wallich, Wall. Cat. 1945 (Lectotype: K000363402, Photo!, designated here).

Liparis rupestris var. *purpurascens* Ridl., J. Linn. Soc., Bot. 22: 268. 1886. TYPE: India, Sikkim, Hooker 106 (Holotype, K-LINDL).

Liparis pulchella Hook.f., Icon. Pl. 19: t.1810. 1889 & Fl. Brit. India 5: 693. 1890; Kataki, Orch. Meghalaya: 34. 1986. *Leptorkis pulchella* (Hook.f.) Kuntze, Revis. Gen. Pl. 2: 671. 1891. TYPE: India, Khasia, Hooker & Thomson 104 (Lectotype: K000387763, designated here; isoelectotype K); Naga Hills, Prain 58 (Residual syntype K).

Liparis angkae Kerr, Bull. Misc. Inform. Kew 1927: 215. 1927. TYPE: Thailand, Pa Ngem, Doi Inthanond, 2100m., Kerr 497 (Lectotype K, inadvertently designated by Seidenfaden, 1976).

Liparis tigerhillensis A.P. Das & S. Chanda, J. Econ. Taxon. Bot. 12(2): 403. 1988 (1989); Sath. Kumar & Manilal, Cat. Ind. Orch.: 78. 1994; N. Pearce & P.J. Cribb, Orch. Bhutan: 203. 2002; Misra, Orch. India: 306. 2007; D.K. Ghosh & J.K. Mallick, Fl. Darjeeling Himalayas: 728. 2014; S.K. Singh et al., Orch. India Pic. Guide: 349. 2019; Agrawala et al., Wild Orch. West Bengal: 339. 2023 (excl. photograph). **syn. nov.** TYPE: India, West Bengal, Darjeeling, Tiger Hill, 2500 m., A.P. Das 1051 [Holotype CAL (could not be traced); A.P. Das 1051 A&B, Isotypes CAL (could not be traced); A.P. Das 1051 C, Isotype Herb. Pres. College Calcutta (could not be traced); A.P. Das 1051 D, personal herbarium of A.P. Das (could not be traced)]; Lectotype: Plate-2 at page 403 of A.P. Das & Chanda (1989), designated here.

Description: Terrestrial herbs, up to 25 cm high. Roots distantly distributed all along the rhizome. Rhizome stout, elongated, with pseudobulbs at 3 – 10 cm apart. Pseudobulbs 2–5 × 1–2 cm, ovoid-conical, compressed, striated, enclosed by whitish, membranous sheaths; developing shoot elongated, enclosed in sheaths and sheathing leaf-bases. Leaves 2, thin textured, 4–12 × 4–10 cm, broadly ovate to sub-orbicular, margin entire to irregularly obtuse-crenate, acute; base rounded or cordate; petiole 5–10 cm long, sheathing, non-articulate. Raceme terminal on the developing shoot, 8–25 cm long, erect, glabrous, ridged, winged; peduncle with 1–few sterile bracts; rachis laxly few to many flowered. Floral bracts 5–10 × 1.5–2 mm, lanceolate, acuminate. Flowers successive, 12–18 mm across, green, with purple petals and labellum; labellum with darker veins. Pedicel and ovary 3–7 mm long, greenish. Sepals sub-similar, 5–8 × 1.8–2 mm, lanceolate, acuminate, margin revolute, 3-veined; dorsal sepal strongly reflexed; lateral sepals closely placed below the labellum. Petals 6–8 × 0.3–0.4 mm, linear, spreading, 1-veined. Labellum 8–12 × 4–6 mm, simple, flat, broadly elliptic-lanceolate, slightly cordate at base, with a smooth, central ridge, surface with many prominent veins, margin entire, apex triangular-acute, mucronate, often reflexed backward giving an obscurely 3-lobed appearance, base with 2 short calli. Column 3–4 mm long, arcuate, broad at base with 2

purplish spots, narrowly winged at apex. Capsules 12–15 × 5–6 mm, erect, clavate-oblong, ridged, with 4–5 mm long stalk (Figure-1).

Fl. & Fr.: May–October.

Habitat: Terrestrial; on road side walls and exposed forest floor at 1000–2800 m.

Global Distribution: India, Bhutan, China, Indo-China, Nepal, Thailand.

Distribution in India: Arunachal Pradesh [Anjaw, Goiliang]; Meghalaya [Mawphlong, Shillong Peak, Mawsmi, Cherrapunjee, Lawlyngdoh]; Nagaland [Kohima, Pulebadze, Akulato, Pfutzero]; Sikkim [Fambonglho, Bhusuk, Pangolakha, Righu, Kabi, Shotok, Chungthang, Tendong, Moinam, Barsey, Hilley, Nambu, Bakhim]; West Bengal [Lava, Richi, Pheshok Road – Ghum, Richita- Joributti, Neora valley National Park, Tiger Hill, Senchal WLS, Singalila NP].

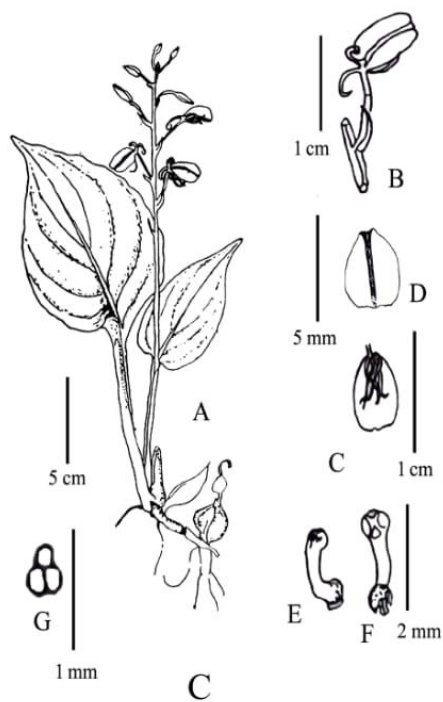
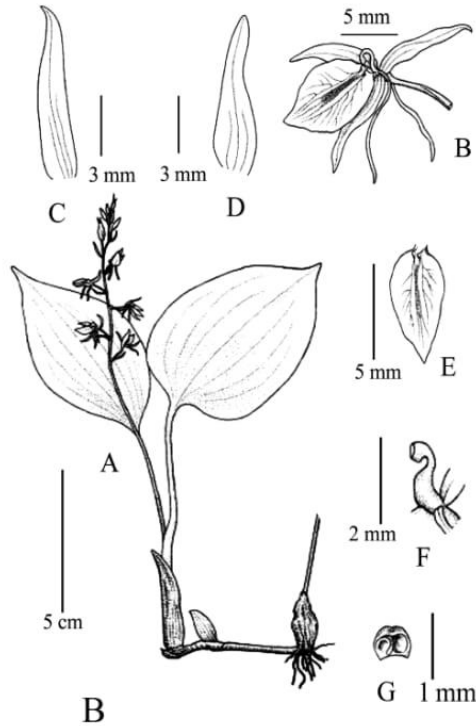
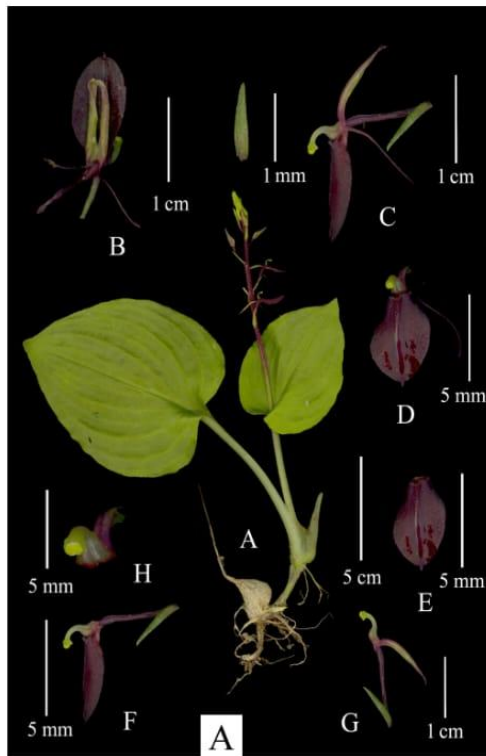
Specimens examined: **Arunachal Pradesh:** Anjaw, Goiliang, 16.04.2010, *Gogoi* 21066 (ARUN). **Meghalaya:** Khasi & Jaintea hills, Lawlyngdoh, 13.08.1837, *Bor* 15746 (ASSAM); Peak Forest, 20.08.1938, *Sharma* 19782, 19783 (ASSAM); Mawphlong, 23.06.67, *Krishna* 38006 (ASSAM); Mawphlong, 17.06.72, *Hynniewta* 50897 (ASSAM); Lawlyngdoh, 27.09.1962, *Stalin* 28785 (ASSAM); Mawphlong, 26.06.1956, *Deka* s.n. (ASSAM); Shillong, 13.08.1931, *Kanjilal* 9314 (ASSAM); Mowsmi, 30.06.1930, *Kanjilal* 8149 (ASSAM); Mawphlong, 06.06.1973, *Hajra* 51946 (ASSAM). **Nagaland:** Kohima, *Bor* 21701 (ASSAM); Pulebaze,

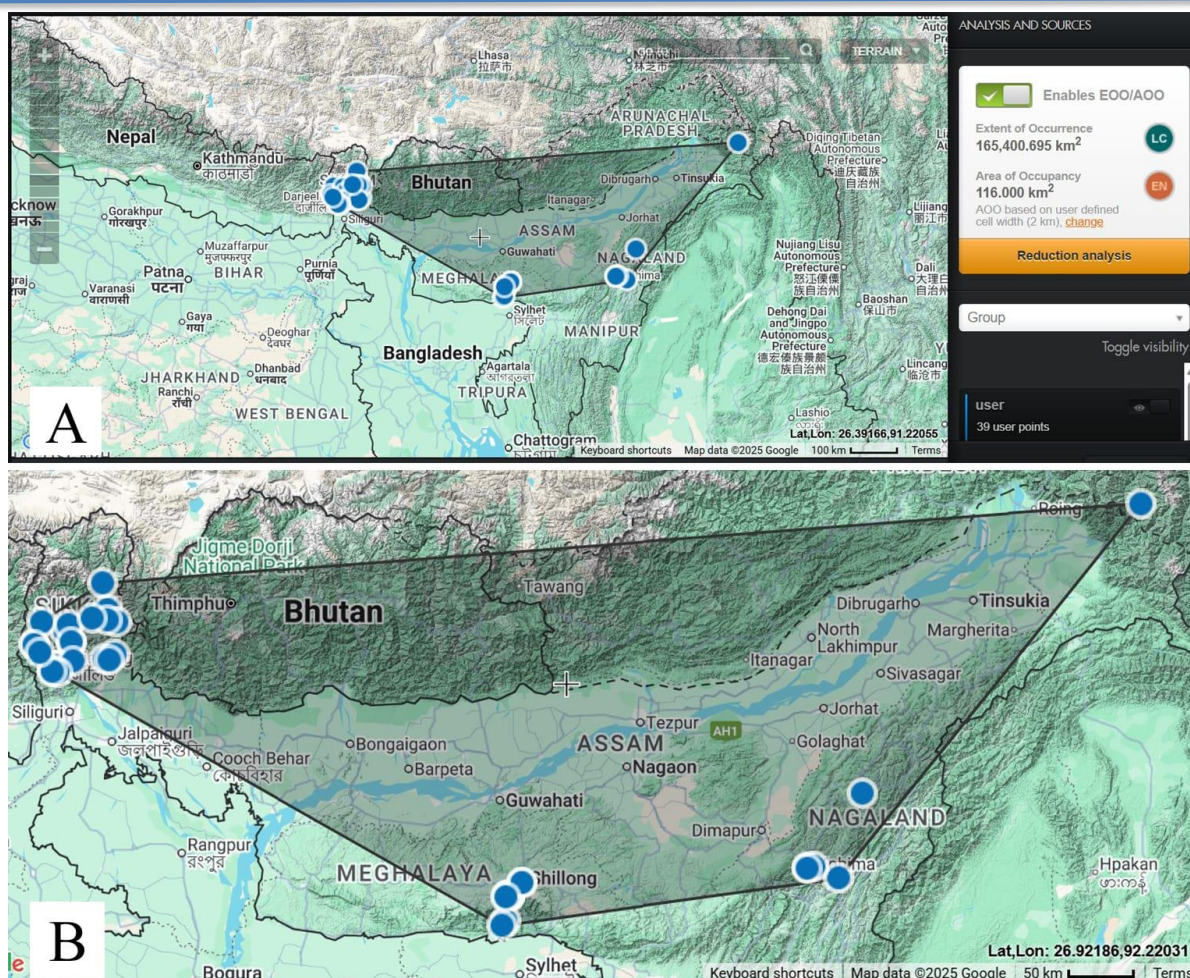
August 1886, *Pantling* 58 (CAL); Akulato, *Hynniewta* 80875; Kohima, *Hynniewta* 80777 (ASSAM); *Prair* 58 (CAL); Pfutdero, *Hynniewta* 80985 (ASSAM). **Sikkim:** s.l., 6000 ft., May 1891, *Pantling* 217 (CAL); Sikkim, South district, Tendong R.F., Damthang forest, 2600 m, 25.06.2003, *Sahoo* 26576 (BSHC); North district, Kabi – Shotok, 1450 m, 23.07.85, *Raju* 3886 (BSHC); *Kuroshava*, *Ohashi* s.n. (TI); *Hooker* 106 (K, K-LINDL); *Pantling* 217A (BM,W); 217B (BM, K, W). **West Bengal:** Neora valley N.P., Lower Reichitta – Joributti, 15.10.1994, *Das & Rai* 0420 (NBU); Darjeeling, *Cowan* s.n. (E, K); *Griffith* 5067, 5068, 5069 (K); Laba, 8000 ft., 07.08.14, *Cave* s.n. (CAL); Laba, 8000 ft., 27.08.14, *Anonymous* s.n. (LBG); Richi La, 9000 ft., 12.08.12, *Anonymous* s.n. (LBG).

TAXONOMIC NOTES:

Liparis petiolata (D.Don) Hunt & Summerh. was described by D. Don (as *Acianthus petiolatus*) in February 1825 based on specimens listed under Wallich Cat. No. 1945. Simultaneously, Lindley (April 1825) also published *Liparis nepalensis* based on the same Wallich Cat. No. 1945. Seidenfaden (1976) discussed about the variability of *Liparis petiolata* in the size of plants and floral parts and considered Wallich Cat. 1945 was representing a mixture of larger and smaller specimens. He also synonymized *Liparis pulchella* Hook.f. and *Liparis angkae* Kerr under *Liparis petiolata* considering the similarity in vegetative and floral morphology. The species is characterized by terrestrial plants with elongated rhizomes; long-petiolate leaves; conspicuous flowers; simple labellum with acute-acuminate apex which are reflexed sometimes providing obscurely 3-lobed appearance.

Das and Chanda (1989) described *Liparis tigerhillensis* based on few plants collected from Tiger Hills, Senchal Forest Division of Darjeeling district. They differentiated it from *Liparis rostrata* and *Liparis odorata* but didn't compare with *Liparis petiolata*. The type specimens mentioned in the protologue are not traceable in any of the designated herbaria, but the illustration and original description clearly indicate that it can not be differentiated from *Liparis petiolata*. Therefore, it is reduced under the synonymy of *Liparis petiolata*. As the type specimens of *Liparis tigerhillensis* are missing, the illustration in the protologue remains as the only original material and it is designated here as lectotype of the name *Liparis tigerhillensis*.





RED LIST ASSESSMENT AND JUSTIFICATION:

Liparis petiolata is a South-East Asian species distributed in India, Bhutan, China, Indo-China, Nepal, Thailand. In India the species is known from Arunachal Pradesh, Meghalaya, Nagaland, Sikkim and West Bengal. All the occurrence points in India were geo-referenced and distribution map was prepared in GeoCAT domain (Figure-2). There are four locations – one each at Arunachal Pradesh, Meghalaya, Nagaland and Sikkim-Darjeeling Himalaya. Few mature individuals were observed at Arunachal Pradesh and Sikkim during the present study. All these locations are subjected to threats like developmental activities, tourism, deforestation for expansion of agricultural land resulting in declining habitat quality. Sporadic harvesting was also observed for this species to be used as ornamental. Pollination and seed germination are vector dependent. The Extent of Occurrence (EOO) and Area of Occupancy (AOO) are calculated through GeoCAT as 165400.695 Km² and 116 km² respectively. Data on the past population size and decline is not available for this species. Considering the above threats, and by applying Criterion B of IUCN, this species is preliminarily assessed as Endangered [EN B2ab(iii,

v)]. As the species is distributed in the neighbouring countries like Bhutan, China, and Nepal with continuous suitable habitat with India, there is a possible geneflow between these sub-populations. Therefore, as per the IUCN guidelines for regional assessments, the preliminary assessment has been downlisted to Vulnerable°. Habitat conservation, ex-situ conservation and further research are recommended conservation measures for this species.

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